

DEPARTMENT OF GENERAL SERVICES

TELECOMMUNICATIONS DIVISION

601 SEQUOIA PACIFIC BOULEVARD
SACRAMENTO, CA 95814-0282
(916) 657-9903



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June 18, 1997

Mr. William F. Caton, Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554-0001

Dear Mr. Caton:

The State of California, Department of General Services, Telecommunications Division herein submits comments in the matter of the MSS Coalition Petition for Partial Reconsideration with regard to ET Docket 95-18. In accordance with Commission requirements, enclosed are the original and nine copies of our comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Pete Wanzenried', followed by a horizontal line.

PETE WANZENRIED, Chief
Public Safety Radio Services

PW:GSN:ro

Enclosures

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the matter of

Amendment of Section 2.106 of the
Commission Rules to Allocate Spectrum
at 2 GHz for Use by the Mobile
Satellite Service

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ET Docket 95-18

To: The Commission

**OPPOSITION OF THE STATE OF CALIFORNIA TO
MSS COALITION PETITION FOR PARTIAL RECONSIDERATION**

The State of California hereby submits the following Opposition to the Petition for Partial Reconsideration of the MSS Coalition in the above-captioned proceeding. Among other matters, the MSS Coalition is asking the Commission to reverse its decision in the First Report and Order and Further Notice of Proposed Rulemaking ("First Report and Order") to require mobile satellite service (MSS) licensees in the 2 GHz band to pay the cost of relocating incumbent fixed microwave licensees.

I. Introduction and Background

The California Department of General Services, Telecommunications Division operates a large microwave system extending throughout the State of California. This system is used by various state agencies to interconnect and control land mobile radio communications systems used in public safety operations and for other critical communications. Currently, the system comprises 365 paths or hops operating in various frequency bands, including 95 paths in the 2130-2150/2180-2200 MHz band affected by this petition. Prior to reallocation of the 1850-1990 MHz band for "PCS" systems, the State's Public Safety Microwave System had nine paths operating in that band. To date, one of the nine paths has been deleted and seven others are being converted to other bands through agreements made with "PCS" providers. Changeout of the ninth path is pending resolution of a technical problem. Thus, the State of California has experience in the real cost of replacing existing 2 GHz microwave service with other frequency bands and the impact upon the user of making such conversions.

The Commission, in ET Docket 92-9, reallocated the 1850-1990 MHz and the 2110-2200 MHz bands for new emerging telecommunications technologies. In recognition of the large number of incumbent microwave facilities which would be displaced by this reallocation, the Commission's rules require that licensees of new technologies must compensate incumbents for the cost of relocating to other frequencies. The compensation for relocation is to be determined through a negotiation

process with specified voluntary and mandatory negotiation periods. This process has been in effect for three years with regard to the “PCS” band at 1850-1990 MHz, and it has been the State’s experience that the process works well.

In the First Report and Order in this proceeding, the Commission reallocated the 2165-2200 MHz band for MSS downlinks. While this reallocation affects only one half of the existing 2.1 GHz fixed microwave band, it effectively eliminates the entire band. This is due to the standardized pairing within the band. Microwave paths, which typically require two-way communications, are allocated on a paired-channel basis with one frequency from the 2130-2150 MHz portion of the band being paired with one frequency from the 2180-2200 MHz portion of the band¹. The frequencies operate in opposing directions over the path and are selected to minimize interference. Thus, reallocating one half of the band affects the usefulness of the entire band for point-to-point microwave services.

The Commission’s First Report and Order also included a Further Notice of Rulemaking seeking comments regarding specific relocation procedures to be used for the frequencies reallocated to MSS. In this document, the Commission affirmed the principal that new emerging technology licensees (i.e. MSS providers), not the incumbents, must bear the cost of relocation. The State of California strongly opposes the MSS Coalition’s request for reconsideration of that determination.

¹ FCC Rules at Section 101.147(d)

II. MSS Licensees Must Pay the Cost of Relocating Incumbent Microwave Users

The MSS Coalition's entire argument is based upon the cost of the relocation obligation on their operations—they completely ignore the impact upon the incumbent users if they do not bear the cost of relocation. The State of California has invested hundreds of millions of dollars in developing its Public Safety Microwave Network. In particular, a large number of paths operate in the 2.1 GHz portion of the band being reallocated to MSS because the Commission rules and procedures mandated that we use that band for those paths. Admittedly, use of the 2.1 GHz band was advantageous from the standpoint of lower-cost radio equipment, antennas, and accessories. Furthermore, the band offered good propagation characteristics which allowed paths to operate over long distances. Thus, use of the 2.1 GHz band was desirable from the user perspective. Nonetheless, the Commission rules required users to select frequency bands based upon making efficient use of the spectrum as determined by the expected channel loading of the system. Oftentimes, our channel loading needs were on the order of 10-20 channels. Since the 2.1 GHz band was the only band channelized to provide the narrow bandwidths associated with such lightly loaded systems, the rules compelled us to use this band.

The MSS Coalition's argument that incumbents could migrate off of the 2.1 GHz band through normal replacement ignores the very real cost of relocation. First, the MSS Coalition suggests that incumbents normally amortize their fixed microwave

equipment over a period of ten years. Thus, the MSS Coalition argues, by the time the MSS providers deploy their systems, incumbent users should have had ample time to relocate as part of a routine replacement of their “old” equipment. This argument is fallacious. The State of California routinely operates its microwave radio equipment for 16-20 years. Thus, existing equipment would not be nearing the end of its useful life-cycle when MSS is deployed, rather it would be entering the prime of its life-cycle.

Second, the MSS Coalition would have the Commission believe there are few if any additional costs associated with moving from the 2.1 GHz band to some other band. Not only is this not true, the additional costs of making such a transition can be very significant. As previously stated, use of the 2.1 GHz band was attractive because the equipment was relatively low in cost. The lesser cost for 2.1 GHz radio equipment is based upon two factors. First, the technology required for making a narrow-bandwidth radio is much simpler than the technology required to make the wider-bandwidth radio associated with the higher frequency bands. Second, the technology associated with generating lower frequencies is much simpler than the technology associated with generating higher frequencies. Thus, the 2.1 GHz radio is a relatively simple radio to produce. Replacing those radios with higher frequency radios, as required by the reallocation plan, means using a more complex radio which simply costs more money, in fact, nearly twice the cost of the 2.1 GHz radio.

The antenna feedline systems for the alternative frequency bands also are more expensive. For the 2.1 GHz radios, incumbent users were able to use a product known

as Heliac® for the feedline. This product is small in diameter, easy to handle, and is relatively impervious to water intrusion. With relocation to the higher frequencies, users must utilize some form of waveguide. Not only is waveguide more expensive than Heliac, it also is more difficult to handle. Additionally, waveguide systems often require a dry-air pressurization system to keep water out of the feedline.

Furthermore, the antennas for the higher frequency bands are more expensive. Antennas for 2.1 GHz systems, typically, are six or eight foot diameter parabolic antennas with a grid reflector. The antennas for the higher frequencies, typically, are eight or ten foot diameter parabolic antennas with a solid reflector. This increase in size and the difference in the antenna's construction results in a higher cost.

Thus, changing-out the radio system to a higher frequency result in costs associated with the feedline and the antenna, costs which would not be incurred as part of a routine replacement. But changing-out the antenna has another, more insidious cost impact. With the antennas being both larger and of a solid design, they not only weigh more, they also present a much greater wind-load to the tower. This increase in weight and wind-loading may require an upgrade/replacement of the tower, the cost of which can be considerable. For example, of the thirteen antenna towers associated with the seven paths the State is replacing as part of the "PCS" reallocation, five of the towers had to be replaced to accommodate the new antennas.

There is yet another cost factor to be considered. The physical size of 2.1 GHz radio equipment is relatively small, often occupying just a few inches of vertical rack

space. The replacement equipment, often requires two feet or more of vertical rack space. If the radio vault is nearly full, changing-out the radio may require an upgrade to the radio vault to accommodate the new equipment. Of the thirteen State radio vaults affected by the 1.9 GHz "PCS" reallocation, two had to be upgraded to accommodate the larger equipment. Since 2.1 GHz microwave equipment, typically, is much, much smaller than the 1.9 GHz equipment, we expect the vault space problem to be much greater as that equipment is replaced to accommodate the MSS providers.

Thus, there are many costs associated with changing-out an existing 2.1 GHz microwave path---costs which are above and beyond those which could be attributed to the cost of replacing a radio due to old age. Some of those costs are not insignificant either. A new antenna tower or radio vault may cost \$100,000 or more to install.

Finally, the MSS coalition would have us ignore one other very real factor in moving from 2.1 GHz to some other, higher frequency band. This factor is functionality. Some 2.1 GHz paths operate over long distances. It may not be feasible to operate over these same distances at the higher frequencies. Other paths operate over non-line-of-sight paths which would not function at higher frequencies. Resolution of either of these two problems is likely to require the development of an interset site (or sites) to allow the path to be broken into smaller segments. While two or more "sub-paths" may allow the reconfigured "path" to operate at a higher frequency, it does so at a significant cost impact. Not only must the number of radios, antennas, and other support equipment be doubled (assuming one interset point), but a new site may also have to

be developed. This is not an insignificant problem. Assuming a site can be found which provides the needed "pathways", then use of the land must be obtained, either through lease or purchase, and appropriate permits obtained, a task which is complicated by environmental concerns and the current public opinion about radio sites. A radio vault and antenna tower must be constructed at the site. Commercial power must be delivered to the site and, for reliability purposes, an alternate source of power (either an electric generator, batteries, or both) must be provided to ensure continued operation in the event of a commercial power failure. A road may have to be constructed to allow access to the facility. The development costs for a new radio site can easily exceed \$250,000. How real is this possibility? Of the nine 1.9 GHz paths being cleared by the State for "PCS" services, one path will require an intersite point (probably a complete new radio site) to complete the replacement.

Thus, the cost of changing-out the existing 2.1 GHz fixed microwave systems is not insignificant. It is not reasonable to expect the incumbent users to bear the cost of this replacement---after all, they are the injured party in this matter. The incumbent users did not ask to be relocated, it is not to their advantage to be relocated. It is the MSS providers, including the MSS Coalition, who want this spectrum reallocated so that they can offer new services to the public and make a profit in the process. Relocating the incumbent users must be one of the costs associated with providing these new services. California's taxpayers should not be asked to fund relocation of our 95 paths.

The MSS Coalition argues that they may be able to share the spectrum with the incumbent users. But if one looks carefully at their argument, they really are not suggesting that they could co-exist with the incumbents. Rather, they are arguing that given the timeline for deployment of their systems, the incumbents will have had time to vacate the spectrum at the incumbent's expense. But, this timeline can be looked at from another perspective---it allows the MSS providers time to negotiate with the incumbents and to develop/implement a plan to move the incumbents to alternative spectrum. While the MSS Coalition argues that the task of dealing with all of the incumbents nationwide is a formidable one, their timeline suggests they have several years to accomplish the task as opposed to the several months the "PCS" providers have needed to clear the 1.9 GHz spectrum for their usage.

For the reasons stated above, the State of California strongly recommends the Commission reject the MSS Coalition Petition for Partial Reconsideration in the above-captioned proceeding.

Respectfully submitted,

STATE OF CALIFORNIA

By:  _____
Pete Wanzenried, Chief Public Safety Radio Services
Department of General Services, Telecommunications Division
601 Sequoia Pacific Boulevard
Sacramento, California 95814-0282